Before an Independent Hearings Panel
appointed by Christchurch City Council

under:	the Resource Management Act 1991
in the matter of:	proposed Plan Change 14 (Housing and Business Choice) to the Christchurch District Plan
and:	**Lyttelton Port Company Limited** Submitter 853

Statement of Evidence of Nevil Ian Hegley (acoustics)

Dated: 20 September 2023

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STATEMENT OF EVIDENCE OF NEVIL HEGLEY

INTRODUCTION

1 My full name is Nevil Ian Hegley.

2 I have the following qualifications and experience relevant to the evidence I shall give:

2.1 I have specialised in acoustics for over 40 years.

2.2 I have an MSc from Southampton University (UK) where I undertook research in acoustics in 1975/76.

2.3 I have been on most of the New Zealand Standards sub-committees dealing with sound issues since 1977 and I was the Chairman of both of the sub-committees that approved the 1984 and 1999 versions of the Construction Noise Standard NZS6803.

2.4 I have provided acoustic advice to Lyttelton Port Company Limited (*LPC*) for over 25 years.

2.5 I have been involved with a number of projects related to port noise, including the distribution centres for the Warehouse, Fonterra, and the Nelson, Tauranga and Whangarei ports. I have also been involved with numerous projects that relate to industrial noise control.

3 I am familiar with the submission made by LPC (submitter number 853) on 12 May 2023 and the noise issues discussed in that submission. I have been authorised by LPC to provide evidence on its behalf.

CODE OF CONDUCT

4 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I have complied with it in preparing my evidence on technical matters. I confirm that the technical matters on which I give evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from my opinions expressed.

SCOPE OF EVIDENCE

5 I have been asked to comment on the relief sought by LPC in relation to the proposed Plan Change 14 (Housing and Business Choice) to the Christchurch District Plan (*PC14*).

6 My evidence focuses on LPC's Inland Port facility at Woolston. The evidence of **Crystal Lenky** describes the facility and the evidence of **Andrew Purves** sets out the history of the arrangements for managing noise from the facility. My evidence will address:

6.1 The current requirements for managing noise from the Inland Port.

6.2 The effects of increasing the height of residential development to three levels at the properties on the western side of Port Hills Road opposite the Inland Port.

6.3 The recommended design requirements for such development at these properties.

6.4 The traffic noise effect on the proposed acoustic design.

7 In preparing my evidence, I have considered the following with respect to the residential use located on the western side of Port Hills Road opposite the LPC Inland Port site. Of specific interest are the residential sites at 311 – 321 Port Hills Road.

SUMMARY AND CONCLUSIONS

8 The Inland Port has been designed for and operates to its existing consent conditions. However, should any multilevel residential development be undertaken at the Port Hills Road properties opposite the Inland Port there will be higher noise levels experienced by the residents than would be considered reasonable in terms of both the District Plan and generally accepted night time criteria.

9 To control any potential noise nuisance and reverse sensitivity effects it is recommended any new or extensions to existing habitable spaces of any development located within the Inland Port Influences Overlay shall be designed and constructed so that noise in any habitable space from the Inland Port will not exceed an internal sound design level of 30dB L_{Aeq} with ventilating windows or doors open or with windows or doors closed and mechanical ventilation installed and operating.

10 To provide certainty with the acoustic design a level of 50dB L_{Aeq} on any façade facing north to north-east towards the Inland Port should be assumed.

11 A level of 47dB L_{Aeq} on any façade within 90 degrees of facing north to north-east and has partial line of sight to any part of Inland Port should be assumed.

12 Reliance for the internal noise level to be achieved should not rely on any rule developed for other forms of noise control.

13 With the above controls in place conflict between noise from the Inland Port and future residential development will be reduced if not entirely avoided.

CURRENT NOISE REQUIREMENTS

14 The current requirements for managing Inland Port noise for the above residential sites are set out in the resource consent RMA 92013975 dated October 21, 2009. **Mr Purves'** evidence sets out the background of this consent. Conditions 6 and 7 of this consent state (emphasis added):

> 6. *Noise emissions associated with the authorised activities shall not exceed 41 dBA $L_{eq\ (1\ hour)}$ or 68 dBA L_{max} between 2200 and 0700 hours the next day at the road Boundary of the following Living Hills zoned sites:*
>
> - *311 Port Hills Road*
> - *313 Port Hills Road*
> - *315 Port Hills Road*
> - *317 Port Hills Road*
> - *319 Port Hills Road*
> - *319A Port Hills Road*
> - *321 Port Hills Road*
> - *323 Port Hills Road*
>
> 7. *Other than the sites identified in Condition 6, the noise emissions associated with the authorised activities at any site zoned Living Hills shall not exceed 41 dBA $L_{eq\ (1\ hour)}$ or 65 dBA L_{max}.*

15 When determining these conditions, the commissioner considered acoustic evidence presented by myself, the Council's Environmental Health Officer and Dr Jeremy Trevathan plus the traffic noise effects in the area.

16 The consent conditions were based on the single level dwellings that existed at the time the consent was issued, and it can therefore be assumed that they were considered to provide appropriate acoustic protection for them.

17 To comply with the above noise limits, LPC has currently constructed barriers in strategic locations within the Inland Port site using containers stacked up to four high. This provides the necessary screening of noise from the Inland Port so that noise reaching the road boundary of the Living Hills zone across Port Hills Road does not exceed the above noise limits. As mentioned by **Ms Lenky**, the monitoring of the noise at the boundary has shown the screening to be successful.

EFFECTS OF INCREASING THE HEIGHT OF RESIDENTIAL DEVELOPMENT

18 I understand that PC14 would potentially enable a larger number of residential units to be established on Port Hills Road properties opposite the Inland Port with greater height limits for the units

19 Should a three level residential development (or higher) be built anywhere on the sites shown on **Figure 1** below or possibly units of a lesser height built at a higher elevation to the rear of these sites, LPC's current screening approach would not achieve the noise limits contained in the Inland Port consent (and expected by residents). It would be impractical to increase the height of screening within the Inland Port site sufficiently to achieve the consented noise limits for any such new residential development.

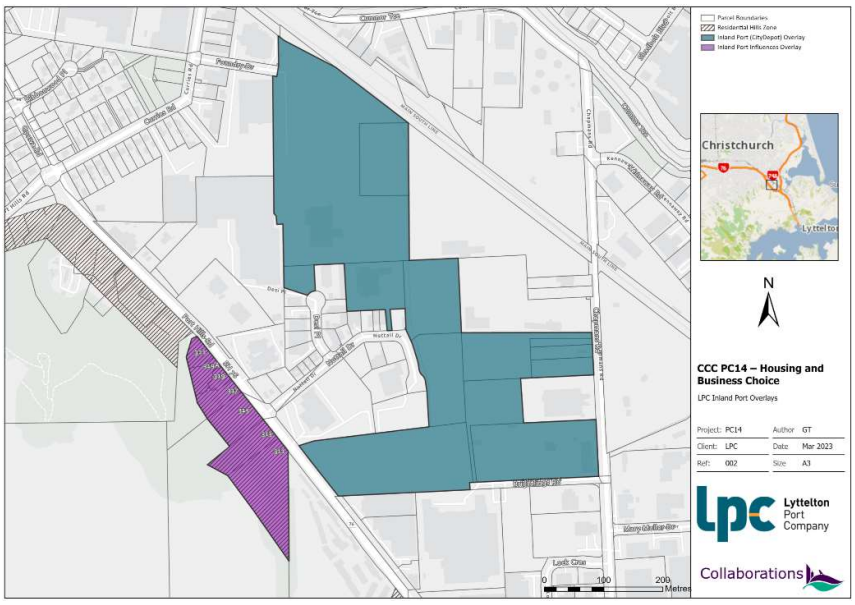

Figure 1. Location of the Inland Port Overlays

20 Without further measures being put in place it is expected there will be adverse reverse sensitivity effects for LPC should there be new three level residential development in the area.

RECOMMENDED DESIGN REQUIREMENTS

21 Should PC14 be implemented as proposed it is recommended there should be acoustic treatment requirements included to reduce the potential for reverse sensitivity effects on LPC from any new or extended noise sensitive activities.

22 There are many scenarios throughout the country where noise sensitive activities are permitted in an environment generally considered to be unsuitable for dwellings. However, if the residential activity is designed to control noise to the inside of the building there can be compatibility between the otherwise two incompatible uses.

23 In this case the noise level from Inland Port activity at the façade of any new residential development would be up to 8dB L_{Aeq} above the night time expectations of the consent conditions.

24 Based on LPC's current mechanism for compliance with the Inland Port consent conditions (i.e. screening), noise effects are suitably managed for the residential units along Port Hills Road. However, the same outcome would not be achieved for new or extended (in height) buildings at a third level, or where units are built or extended at a higher elevation at the rear of these sites.

25 For any such development, the only noise control treatment that would be necessary to achieve a reasonable noise level would be to simply close the windows to any habitable room and provide alternative ventilation. There would accordingly be minimal cost to the developer to avoid any reverse sensitivity effects.

26 However, in practice it would be unusual to implement such a requirement for only third levels of buildings and there would be little additional costs to require such treatment for all new habitable spaces.

27 Thus, the relief sought by LPC is a requirement for acoustic treatment of new or extensions to existing habitable spaces, but with no limitation in relation to the level of the building, as follows:

a. *Any new or extensions to existing habitable space of any development located within the Inland Port Influences Overlay shall be designed and constructed so that noise in any habitable space from the Inland Port will not exceed internal sound design level of 30dB L_{Aeq} with ventilating*

windows or doors open or with windows or doors closed and mechanical ventilation installed and operating.

b. *Determination of the internal design sound levels required under Clause (a), including any calculations, shall be based on noise from the Inland Port as follows*:

i. 50dB L_{Aeq} on any façade facing north to north-east towards the Inland Port;

ii. 47dB L_{Aeq} on any façade within 90 degrees of facing north to north-east and has partial line of sight to any part of Inland Port;

c. Compliance with this rule shall be demonstrated by providing the Council with a design report prior to the issue of the building consent, which is prepared by a suitably qualified acoustics specialist, stating that the design proposed will meet the required internal noise levels.

TRAFFIC NOISE EFFECT ON THE ACOUSTIC DESIGN

28 Appendix 1 - PC5E Noise Recommended Decision recommends the internal noise level in bedrooms and other habitable rooms should be designed to 35dB and 40dB $L_{Aeq(1hr)}$ respectively from traffic noise from Port Hills Road (SH76).

29 In this case, if the building façade is designed to achieve these limits the noise from the Inland Port will also achieve the recommended design limit.

30 It could therefore be argued if the traffic noise rule is in place there is no need to implement a second control for the Inland Port noise. However, not only should the rules be transparent on what they control, LPC cannot guarantee the traffic noise will continue to control the acoustic design sufficiently to protect the Inland Port or that the traffic controls will not be removed at some time.

31 It is therefore appropriate to implement both forms of noise control. This already occurs in many other areas without any problems.

Nevil Hegley

20 September 2023